

BAYOU LA BRANCHE WETLAND (PO-17)
PO-17-MSPR-0596-2
PROGRESS REPORT No. 2
for the period
April 1, 1994 to May 10, 1996

Project Status

The following data collection and analysis activities have been conducted since the previous progress report:

Nineteen staff gauges were installed and an elevational survey of the project area was conducted by Ballard and Associates on April 1-12, 1996. Vegetation and sediment surveys were conducted on May 6-7, 1996. These are the first postconstruction field monitoring activities conducted on this project. Previously, the project area was unsuitable for traversing because of the unconsolidated nature of its sediment.

Project Description

The Bayou La Branche Wetland (PO-17) project is located on the southwestern shore of Lake Pontchartrain in the La Branche Wetland Management area (figure 1). Historically, this area was a brackish marsh that served as a nursery ground for commercially and recreationally important finfish species (Hinchee 1977; Cramer 1978). A failed attempt at agriculture in the early 1900's caused subsidence of the interior marsh, which led to the formation of a large open-water pond. The pond has progressively increased in size, leaving just a narrow band of marsh on the Lake Pontchartrain shoreline. Shoreline retreat along this section of the lake is estimated to be 9.5 ft/yr (Coastal Environments 1984). The purpose of this project is to create new vegetated wetlands in the Bayou La Branche area utilizing dredged sediment. Specifically, the project goals are to create approximately 254 acres of shallow water habitat conducive to the natural establishment of emergent wetland vegetation, and to maintain a minimum of 70% emergent marsh and a maximum of 30% open water after 5 yr.

Project components include an earthen containment berm surrounding the area and approximately 2 million cu/yds of sediment dredged from the nearby Lake Pontchartrain water bottom. The project

is divided into two areas: Pond A and Pond B (figure 1). The barrier between the ponds consists of an existing earthen ridge with a sheet pile z-wall closure and a concrete weir (weir 1), which allows water to flow between Pond A and Pond B. Exterior weirs (weirs 2 and 3) on the eastern berm of Pond B allow excess water to flow out of the project area to the east, and provide an avenue for ingress and egress of marine species during periods of high water.

Two million cu/yds of sediment were deposited in the 515-acre project area between February and April of 1994. A final sediment elevation of 2 ft NGVD is anticipated after settling; however, it is expected that a minimum of 5 yr will elapse before complete consolidation and settling occurs. Cypress trees and brackish marsh plant species will be planted after 5 yr, once the sediment has consolidated. In the interim, to enhance volunteer plant growth and to reduce aeolian transport of sediment, the dredged material was aurally seeded with *Echinochloa crus-galli* var. *frumentacea* (Japanese millet) in July 1994.

Monitoring Design

Near vertical, color-infrared aerial photography (1:12,000 scale) will be taken once in preconstruction and three times postconstruction. It will be georectified, photointerpreted, mapped, and analyzed with a Geographic Information System (GIS) to measure marsh to open-water ratios and to document the marsh loss rate for the project and reference areas. The postconstruction photography dates will correspond with the postconstruction vegetation and elevation monitoring dates. Vegetation transects will be monitored to quantify species composition and relative abundance of emergent vegetation in duplicate 1-m² plots taken at 440-ft intervals for a total of 84 plots (figure 2). Sampling will be conducted during periods of peak vegetation biomass (April-August). Vegetation transects will be monitored coincident with elevation transects conducted preconstruction and at year 2, 3, 4, and every 3 yr thereafter. Vegetation sampling was not conducted during year 1 due to the unconsolidated nature of the sediment. An as-built elevation survey was not conducted because of unavailable funds; however, subsequent elevation transects will be used to document the settling rate of the dredged sediment. Water levels will be measured at 19 staff gauges, located at the intersections of vegetation transects, and at one continuous recorder within the project area and one within the reference area (figure 2). The recorders will be used to determine the duration and frequency of flooding. The 19 staff gauges will be monitored monthly, at a minimum. In order to characterize sediment composition over time, one 10-cm-deep sample will be collected using a "Swenson" corer at 880-ft intervals along the vegetation transects. Sampling will be conducted at year 2, 4, and every 3 yr thereafter. Sediment variables measured will include percent organic matter, bulk density, salinity, and water content.

Results/Discussion

Preconstruction vegetation and sediment data were collected on February 4, 1994, and are presented in tables 1 and 2. The only emergent vegetation in the open water ponds was *Eleocharis parvula* (dwarf spikerush), occurring around the shallower pond edges. Submerged aquatic vegetation was abundant in the ponds with dominate species being *Myriophyllum spicatum* (water-milfoil) and

Ceratophyllum demersum (coontail). The sediment had high water content averaging 53.2%, bulk densities ranging from 0.69 to 1.16 g/cc, percent organic matter from 7.9 to 26.8, and an average salinity of 3.62 ppt.

On May 6-7, 1996, vegetation and sediment surveys were conducted. Preliminary vegetation results indicate that *Solidago sempervirens* (goldenrod) and species of *Ranunculus* (buttercup) dominate the project area. Species composition and relative abundance of vegetation and physical characteristics of the sediment will be described in the next progress report.

Aerial photographs were taken on November 7, 1993 and December 19, 1994 for the preconstruction and first postconstruction surveys, respectively. The National Biological Service analyzed the photography using a GIS and estimated that the project area had 350 acres of new vegetation, 131 acres of existing vegetation, and 34 acres of open water (94% marsh, 6% open water). Ocular estimates during the winter of 1994 determined that the dominant vegetation was Japanese millet, although over 20 emergent marsh species were evident in the impounded pond. Local landowners reported racoons, nutria, and alligators within the project area, and estimated over 20,000 waterfowl were present during the winter of 1994.

In the spring of 1994 and 1995, an attempt was made to place the staff gauges and establish vegetation stations within the project area, however, it was impossible to traverse the site. Only 6 staff gauges were set in 1994, and readings were taken only 5 times during the 1994-95 period. The readings indicated that the gauges were not reliable, therefore, the data will not be used or presented.

On April 1-12, 1996, 19 staff gauges were established throughout the project area. Sediment elevation data from the monitoring of these staff gauges will be examined to determine if the sediment consolidates to the project design criteria of 2 ft NGVD. These results will be addressed in the next progress report.

References

- Coastal Environments Inc. 1984. Environmental characteristics of the Pontchartrain-Maurepas Basin and identification of management issues: An Atlas. Baton Rouge: Louisiana Department of Natural Resources, Coastal Management Division.
- Cramer, G.W. 1978. A nutrient study in the St. Charles Parish wetlands adjacent to Lake Pontchartrain, Louisiana. M.S. thesis. Baton Rouge: Louisiana State University. 69 pp.
- Hinchee, R.E. 1977. Selected aspects of the biology of Lake Pontchartrain, Louisiana. 1. Simulations of man's effects on the Lake Pontchartrain food web. 2. The role of the St. Charles Parish marsh in the life cycle of the gulf menhaden. 3. The fishery value of the St. Charles Parish marsh. M.S. thesis. Baton Rouge: Louisiana State University. 75 pp.

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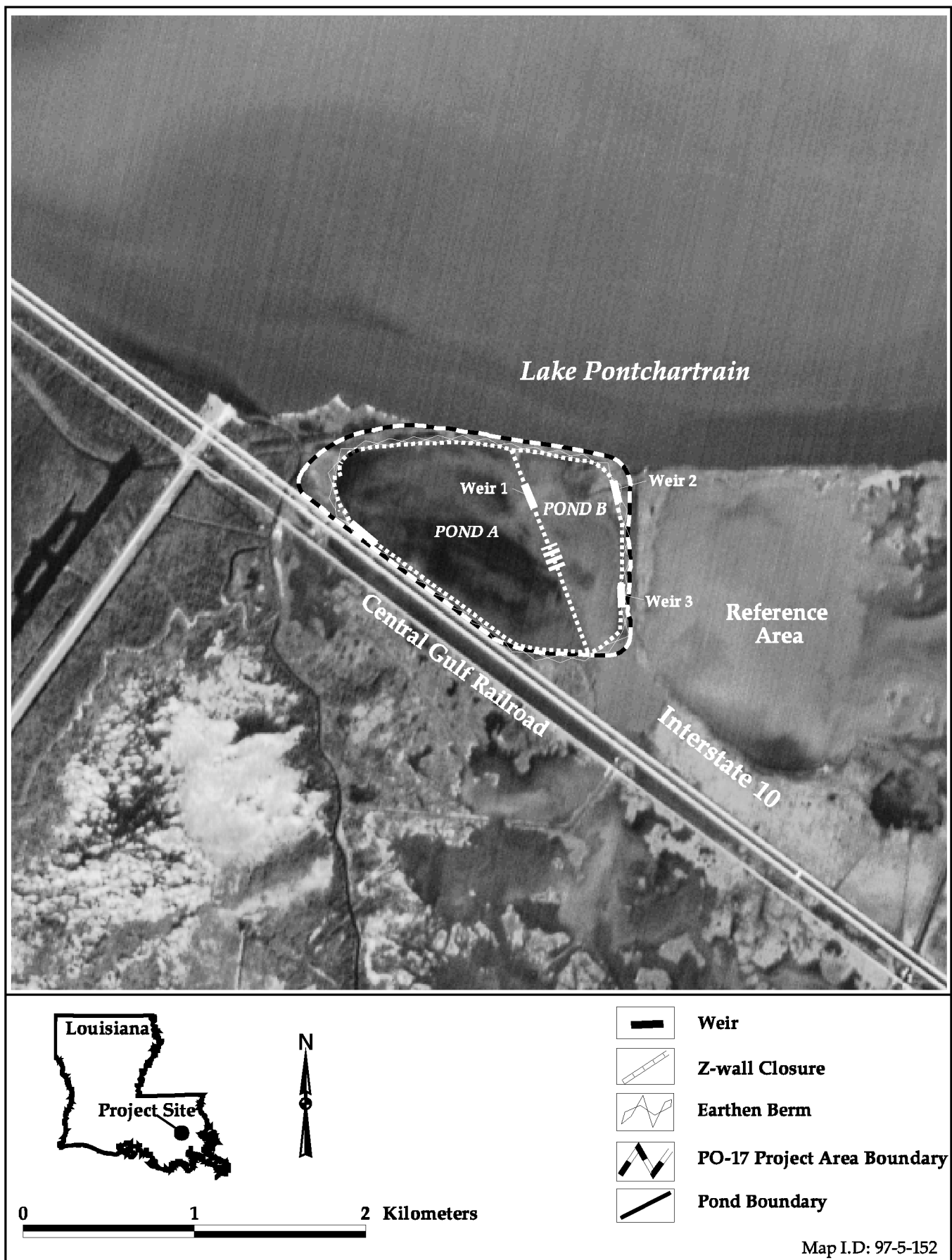


Figure 1. Main Components of Bayou La Branche Wetland Project including Pond A and Pond B.

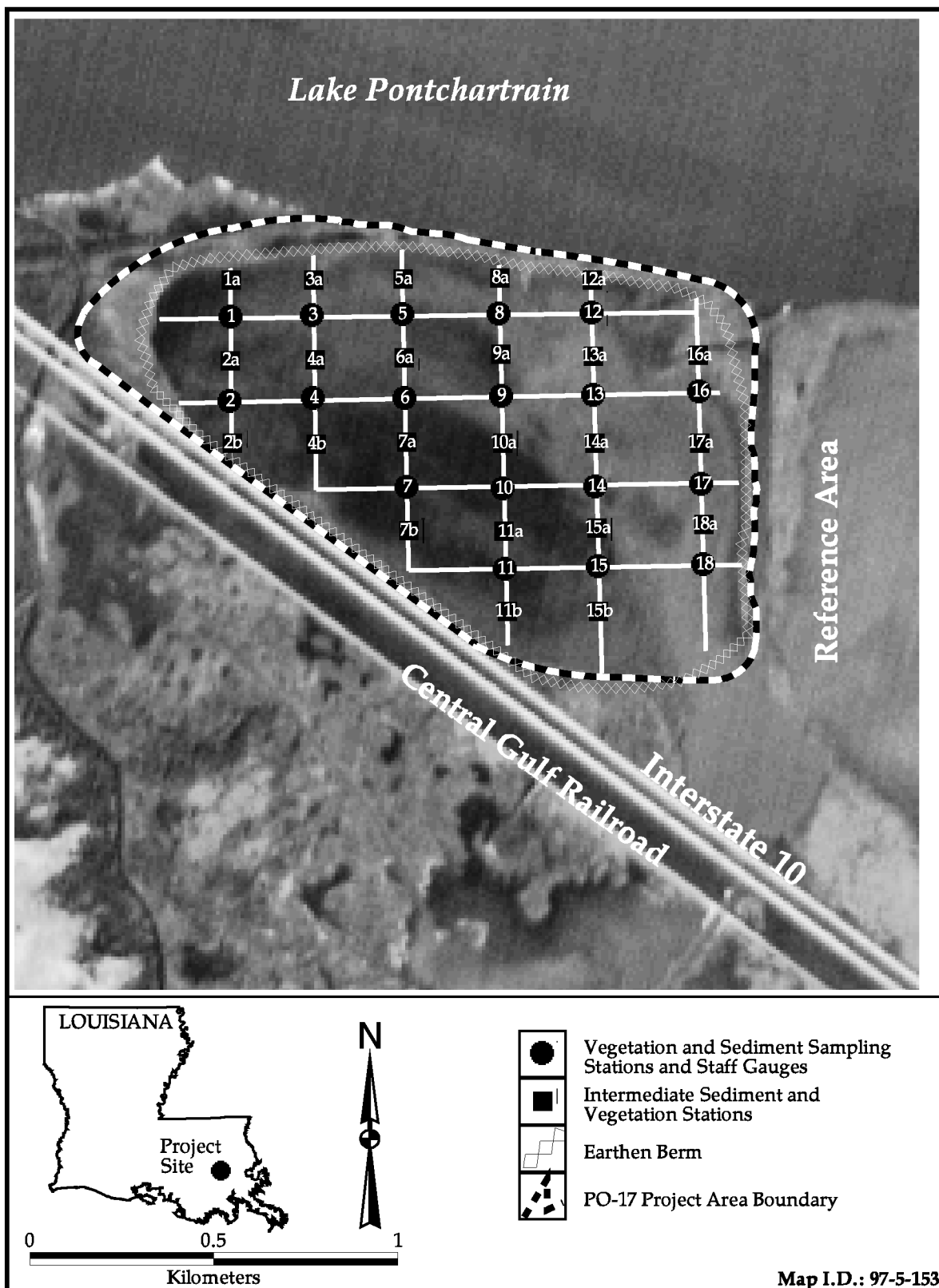


Figure 2. Location of transects and sampling stations.

Table 1. Preconstruction vegetation monitoring conducted on February 4, 1994, showing the average percent cover (%)* for each plant species present per station.

Station	Species					
	<i>Eleocharis parvula</i>	algae spp.	<i>Ceratophyllum demersum</i>	<i>Myriophyllum spicatum</i>	<i>Najas guadalupensis</i>	<i>Ruppia maritima</i>
1		2.5	75	2	5	
1A			25	45	80	
2				Trace		
2A		25	2.5		42.5	
3				Trace		
3A			50	55	2.5	20
4				35	35	
4A		2.5	15	75	5	
4B			35	20	20	
5			50	50	35	
5A				50		
6			100	10	10	
6A			50	75	5	
7				50	60	
7A		10	75	10	35	
7B						
8			2.5	52.5	7.5	
8A			25	30		
9			50	50	20	
9A			25	35	10	
10			50	50	5	
10A			100	50	5	
11		100	30	10	10	
11A			60	20	20	
11B		100	50	50	52.5	
12			30	50		15
12A			7.5	2.5		
13						
13A						
14					2.5	
14A					5	Trace
15		30			5	
15A						2.5
15B					100	
16						100
16A	52.5					
17	50					50
17A	50					50
18	27.5	2.5			2.5	
18A	100					
22	52.5					

*Numbers in table expressed as percent.

Table 2. Physical characteristics of preconstruction sediment samples taken on February 4, 1994.

Station	Organic Matter (%)	Conductivity ($\mu\text{S}/\text{cm}$)	Salinity (ppt)	Dry Weight (g)	Volume (cc)	Bulk Density (g/cc)	Wet Weight (g)	Water (%)
1	17.3	5550	3.66	32.02	41.5	0.77	69.94	54.24
2	15.3	5300	3.50	32.85	41.5	0.80	70.96	53.71
3	15.7	5500	3.63	25.43	31.0	0.825	58.37	56.30
4A	18.2	5575	3.71	26.94	35.0	0.77	64.50	58.19
4	21.7	5425	3.60	14.25	38.5	0.69	68.21	61.17
5	15.3	5550	3.66	29.07	30.0	0.97	70.02	58.48
6	11.0	5500	3.63	32.53	34.0	0.96	66.15	50.84
7	15.8	5575	3.68	25.87	37.5	0.69	63.60	59.36
8	16.0	5550	3.67	27.90	35.0	0.80	68.67	59.37
9	14.2	4725	3.37	23.60	34.0	0.70	61.27	61.20
10	17.2	5500	3.63	30.38	34.0	0.89	68.61	55.71
11A	19.0	5475	3.61	29.90	38.5	0.78	71.08	58.00
11	26.8	5425	3.58	25.23	30.0	0.86	62.92	59.86
12A	13.2	5600	3.69	32.27	38.5	0.84	75.85	57.44
12	17.1	5675	3.75	31.11	37.5	0.83	66.38	53.15
13	26.8	5500	3.63	38.64	35.0	1.10	70.33	45.10
14	16.0	5450	3.60	37.59	32.5	1.16	71.62	47.45
15A	18.8	5450	3.60	29.68	33.5	0.89	67.92	56.27
15	12.4	5100	3.37	39.85	38.5	1.04	75.70	47.37
16	7.9	5850	3.86	47.55	44.5	1.07	80.91	41.24
17	12.8	5275	3.48	43.98	45.0	0.98	77.88	43.55
18A	9.4	5625	3.72	45.29	40.0	1.15	79.29	42.26
18	8.3	5500	3.63	46.43	44.5	1.06	80.65	42.44